

What is claimed is:

1 1. A server apparatus for a space information service
2 comprising:

3 an information bubble managing unit for
4 managing bubble data in which space range information
5 including position information in a real physical
6 space is correlated with supply information in order
7 to virtually register an information bubble related
8 with said desired supply information in said real
9 physical space;

10 an extracting unit for extracting supply
11 information of bubble data including retrieval object
12 space range information based on position information
13 on a user terminal from said information bubble
14 managing unit;

15 a providing unit for providing said supply
16 information extracted by said extracting unit to said
17 user terminal; and

18 an information bubble movement control unit
19 for updating at least position information of said
20 bubble data to virtually move said information bubble
21 in said real physical space.

1 2. The server apparatus for a space information
2 service according to claim 1, wherein said information
3 bubble movement control unit comprises:

4 an information bubble behavior setting unit
5 for setting behavior data defining behavior of said
6 information bubble in said real physical space; and
7 an information bubble moving unit for
8 updating position information of said bubble data on
9 the basis of said behavior data set by said information
10 bubble behavior setting unit to move said information
11 bubble according to said behavior data.

1 3. The server apparatus for a space information
2 service according to claim 2, wherein said information
3 bubble behavior setting unit comprises a random number
4 generating unit for generating a random number with
5 respect to position information of said bubble data
6 as behavior data; and
7 said information bubble moving unit comprises
8 a first information bubble position updating unit for
9 randomly updating position information of said bubble
10 data with the random number generated by said random
11 number generating unit to randomly move said
12 information bubble in said real physical space.

1 4. The server apparatus for a space information
2 service according to claim 3, wherein said information
3 bubble behavior setting unit comprises a condition
4 setting unit for setting condition data with respect
5 to a time to move said information bubble to a specific

6 position in said real physical space as said behavior
7 data; and

8 said information bubble moving unit comprises
9 a second information bubble position updating unit for
10 updating position information of said bubble data to
11 position information on said specific position at a
12 time defined by said condition data.

1 5. The server apparatus for a space information
2 service according to claim 4, wherein said information
3 bubble behavior setting unit sets an initial
4 registered position for said information bubble as
5 said specific position.

1 6. The server apparatus for a space information
2 service according to claim 5, wherein said condition
3 setting unit sets data with respect to an available
4 period to move said information bubble as said
5 condition data.

1 7. The server apparatus for a space information
2 service according to claim 4, wherein said condition
3 setting unit sets data with respect to an available
4 period to move said information bubble as said
5 condition data.

1 8. The server apparatus for a space information

2 service according to claim 4, wherein said information
3 bubble managing unit comprises a supply information
4 updating unit for updating said supply information
5 according to update information about said supply
6 information from user terminals having received said
7 supply information.

1 9. The server apparatus for a space information
2 service according to claim 8, wherein said condition
3 setting unit sets data with respect to the number of
4 times of update of said supply information by said
5 supply information updating unit as said condition
6 data.

1 10. The server apparatus for a space information
2 service according to claim 2, wherein said information
3 bubble behavior setting unit comprises a condition
4 setting unit for setting condition data with respect
5 to a time to move said information bubble to a specific
6 position in said real physical space as said behavior
7 data; and
8 said information bubble moving unit comprises
9 a second information bubble position updating unit for
10 updating position information of said bubble data to
11 position information on said specific position at a
12 time defined by said condition data.

1 15. The server apparatus for a space information
2 service according to claim 1, wherein said information
3 bubble managing unit comprises a supply information
4 updating unit for updating said supply information
5 according to update information about said supply
6 information from a user terminal having received said
7 supply information.

1 16. The server apparatus for a space information
2 service according to claim 1, wherein said information
3 bubble managing unit comprises an information bubble
4 position representation converting unit for
5 converting position information of said bubble data
6 into a geographical representation form in said real
7 physical space; and
8 said providing unit comprises an information
9 bubble present position providing unit for providing
10 information converted by said information bubble
11 position representation converting unit as present
12 position information in said real physical space on
13 said information bubble to a user terminal having
14 registered said information bubble.

1 17. The server apparatus for a space information
2 service according to claim 1, wherein said space range
3 information is defined by latitude, longitude,
4 altitude and a bubble radius in said real physical

5 space.

1 18. A method for providing a space information
2 service comprising the steps of:

3 an information bubble registering step of
4 registering bubble data in which space range
5 information including position information in a real
6 physical space is correlated with supply information
7 in order to virtually register an information bubble
8 related with said desired supply information in said
9 real physical space;

10 an information bubble moving step of updating
11 at least position information of said bubble data to
12 virtually move said information bubble in said real
13 physical space;

14 an extracting step of extracting supply
15 information of bubble data including retrieval object
16 space range information based on position information
17 on a user terminal; and

18 a providing step of providing said supply
19 information extracted at said extracting step to said
20 user terminal.

1 19. The method for providing a space information
2 service according to claim 18, wherein at said
3 information bubble moving step, position information
4 of said bubble data is updated using a random number

5 to randomly move said information bubble in said real
6 physical space.

1 20. The method for providing a space information
2 service according to claim 19, wherein at said
3 information bubble moving step, position information
4 of said bubble data is updated to specific position
5 information when a predetermined period is elapsed
6 after a start of movement of said information bubble
7 to move said information bubble to a specific position
8 in said real physical space.

1 21. The method for providing a space information
2 service according to claim 20, wherein at said
3 information bubble moving step, position information
4 of said bubble data is updated to specific position
5 information when the number of times of update of said
6 supply information by user terminals having received
7 said supply information reaches a predetermined
8 number of times after a start of movement of said
9 information bubble to move said information bubble to
10 a specific position in said real physical space.

1 22. The method for providing a space information
2 service according to claim 19, wherein at said
3 information bubble moving step, position information
4 of said bubble data is updated to specific position

1 26. The method for providing a space information
2 service according to claim 24, wherein said specific
3 position is an initial registered position of said
4 information bubble.

1 28. The method for providing a space information
2 service according to claim 27, wherein said specific
3 position is an initial registered position of said
4 information bubble.

1 29. The method for providing a space information

2 service according to claim 18, wherein said space
3 range information is defined by latitude, longitude,
4 altitude and a bubble radius in said real physical
5 space.

1 30. A charge processing apparatus for a space
2 information service that manages bubble data in which
3 space range information including position
4 information in a real physical space is correlated
5 with supply information in order to virtually register
6 an information bubble related to said desired supply
7 information in said real physical space, and provides
8 supply information of bubble data including retrieval
9 object space range information based on position
10 information on a user terminal to said user terminal,
11 said charge processing apparatus comprising:

12 an attribute information storing unit for
13 storing plural kinds of attribute information being
14 able to define service modes of said space information
15 service;

16 a charge type information storing unit for
17 storing information on plural types of service charges
18 which can be objects of charge in said service modes;

19 a charged account information storing unit
20 for storing information on a plurality of charged
21 accounts;

22 a charge policy setting unit for arbitrarily

2 information service according to claim 31, wherein
3 said attribute information storing unit stores
4 attribute information on a registrant of said supply
5 information.

1 35. The charge processing apparatus for a space
2 information service according to claim 30, wherein
3 said attribute information storing unit stores
4 attribute information on said supply information.

1 36. The charge processing apparatus for a space
2 information service according to claim 35, wherein
3 said attribute information storing unit stores
4 attribute information on a registrant of said supply
5 information.

1 37. The charge processing apparatus for a space
2 information service according to claim 30, wherein
3 said attribute information storing unit stores
4 attribute information on a registrant of said supply
5 information.

1 38. The charge processing apparatus for a space
2 information service according to claim 30, wherein
3 said charge type information storing unit stores
4 information on a use charge and a communication charge
5 for said supply information at the time that said user

21 a charge processing step of executing a
22 charging process to said charged account for said
23 service charge according to a setting at said charge

24 policy setting step.

1 40. The method for charging a space information
2 service according to claim 39, wherein said attribute
3 information is attribute information on said user
4 terminal and a user of said user terminal.

1 41. The method for charging a space information
2 service according to claim 40, wherein said attribute
3 information is attribute information on said supply
4 information.

1 42. The method for charging a space information
2 service according to claim 41, wherein said attribute
3 information is attribute information on a registrant
4 of said supply information.

1 43. The method for charging a space information
2 service according to claim 40, wherein information on
3 said service charge is information on a use charge and
4 a communication charge at the time that said user
5 terminal receives said supply information, and a
6 registration charge for said supply information.

1 44. The method for charging a space information
2 service according to claim 39, wherein said attribute
3 information is attribute information on said supply

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4 information.

1 45. The method for charging a space information
2 service according to claim 44, wherein said attribute
3 information is attribute information on a registrant
4 of said supply information.

1 46. The method for charging a space information
2 service according to claim 39, wherein said attribute
3 information is attribute information on a registrant
4 of said supply information.

1 47. The method for charging a space information
2 service according to claim 39, wherein information on
3 said service charge is information on a use charge and
4 a communication charge at the time that said user
5 terminal receives said supply information, and a
6 registration charge for said supply information.